



Testosterone does not influence Cd40 expression in the human umbilical vein endothelial cells (HUVECs)

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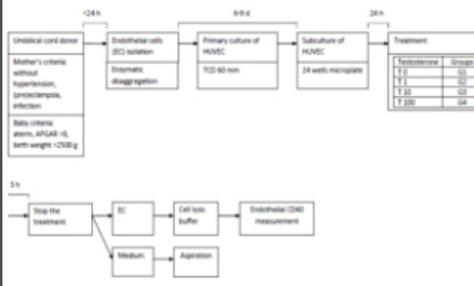
Introduction

Cardiovascular diseases, one of the leading causes of mortality, are suffered by male subjects more frequently than female ones. The concentration of androgen hormones, particularly testosterone, in plasma which is much higher in male subjects compared to female subjects led to allegations of the role of testosterone in cardiovascular events (Kaushik et al., 2010; Spoletini et al., 2011). Cluster of differentiation-40 molecule (CD40) is a receptor on the cell surface that is included in TNF family. CD40 was firstly identified and known to affect B lymphocytes, whereas CD40 ligand (CD40L) is identified to be expressed on CD4+ T lymphocytes. It is now known that CD40 is widely expressed on monocytes, dendritic cells, epithelial cells, and endothelial cells, while CD40L is expressed on mast cells, basophils, eosinophils, monocytes, macrophages, vascular smooth muscle cells, endothelial cells, and platelets (Li et al., 2009).

It is reported that ligation of CD40 on endothelial cells by CD40L of platelets will stimulate endothelial cells and lead to the increase of endothelial ICAM-1 expression (Li et al., 2009). It is known that ICAM-1 is necessary for platelet firm adhesion to the activated endothelial cells (Palomo et al., 2012). Platelets adhesion occurs prior to cardiovascular events, such as the rupture of atherosclerotic plaques (Nieswandt et al., 2011; Swieringa et al., 2014).

Thus it is intriguing to examine whether expression of CD40 in endothelial cells is modulated by testosterone level.

Materials and Methods



Results



Figure 1. Subculture of HUVEC (passage 1)

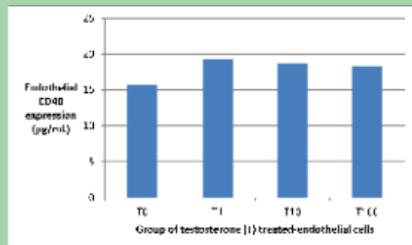


Figure 2. The expression of CD40 in the endothelial cells treated with or without testosterone

Statistical analysis

- Using (multiple) independent t-test it was revealed that CD40 expression in the endothelial cells (EC) without testosterone (T) (15.68 ± 5.81 pg/ml) was not significantly different with those treated with 1 nM T (19.26 ± 2.01 pg/ml; $p = 0.496$), 10 nM T (18.78 ± 2.7 pg/ml; $p = 0.57$), and 100 nM T (18.35 ± 0.2 pg/ml; $p = 0.582$).
- There was a trend of inverse relationship between the dose of T and the expression of CD40 in the EC, however, using one-way ANOVA it was revealed that the exposure of T in incremental doses did not significantly influence endothelial CD40 expression ($p = 0.73$)

Conclusions

Testosterone does not influence the expression of CD40 in normal endothelial cells.

References

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